

e-Prescribing: A Move Toward Appropriate Medication Use

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The way physicians order medications for patients has not changed for more than a century. New technologies, including electronic prescribing (e-prescribing), make the handwritten prescription seem like an archaic link to the past.

e-Prescribing has been defined as the use of computing devices to enter, modify, review, and output or communicate drug prescriptions.¹ The earliest application of physicians ordering medications and other therapies by computer was in hospitals in the 1970s; it became more prominent when the US Institute of Medicine endorsed its use as a way to reduce the 98,000 annual deaths from medication errors among hospitalized patients.²

Now we see the promotion of e-prescribing from varying parties. Current physician use of e-prescribing is estimated to be between 3% and 18%, depending on the definition used.

The need to change how drugs are ordered stems from the tremendous duplication, waste, and inefficiency in the current prescribing of medications. One of the earliest mentions of e-prescribing in the medical literature was in the early 1990s in a study conducted in Wales, which profiled the use of computers for refill prescription prescribing (ie, repeat prescribing).³ A small percentage (11%) of the Welsh physicians used computers for this purpose.³ The authors concluded the article with an exhortation that, "Mechanisms to encourage greater and more sophisticated use of computers and information technology need to be explored."³ In the United States, e-prescribing was touted in the mid-1990s as a means to more accurately transmit physicians' orders.⁴ Others suggested that it would lead to enhanced medication use in hospitals and beyond.⁵ Medicare has begun a process of incentivizing physicians who successfully use e-prescribing over a 4-year period. These payments amount to a 2%



incentive in 2009 and 2010, 1% in 2011 and 2012, and 0.5% in 2013.⁶

Alaska became the last of the 50 US states to enable e-prescribing in mid-August 2007. Varying estimates have suggested that 21% of physicians have access to information technology with e-prescribing systems in place.⁷ A recent survey showed that although a vast majority of the physicians surveyed (85%) think e-prescribing is a "good idea," only 7% use the technology at present.⁸

Several observations are important. Small, independent pharmacies have been slow to upgrade their pharmacy management systems to accept e-prescriptions because of large fees charged by software vendors. Large chain pharmacies embrace e-prescribing at the corporate level, but local store support is low, and there is inadequate training of pharmacy staff.⁹

The Limits of e-Prescribing

A number of problems related to the prescribing, dispensing, and drug-use process will not be influenced by e-prescribing. Some of these are drug-specific, patient-specific, or system-specific. Patient medication noncompliance and persistence, over the counter (OTC) drug misuse, adverse drug reactions, prescribing errors, and/or dispensing errors are commonplace. No systems yet devised or planned can totally eliminate these problems from negatively influencing appropriate drug use in the US healthcare system.

There are fundamental flaws in the drug-use process in the United States. Medication compliance hovers around 50%, and prescription drug misuse is rampant. OTC medications are misused. Adverse drug events (often preventable) occur because of inadequate information available. Antibiotic misuse and overuse has led to many drug-resistant strains. Despite recent changes to Medicare with the Part D program, many patients remain uninsured for prescription medications. e-Prescribing will not by itself affect these and other systemic medication-related error-producing system segments.

Despite elaborate and sophisticated health information technology (HIT)-enabled e-prescribing, errors will continue to be made. Physicians have the potential

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to make errors in prescribing (wrong patient; right patient wrong drug; wrong dose and/or wrong duration of therapy). Pharmacists also commit errors in dispensing, labeling, misreading orders, and/or dispensing to the wrong patient. Patients are also able to underdose, overdose, use the wrong drugs for the wrong length of time, and/or use the right drug for the wrong period of time.

A startling 15% of diagnoses are estimated to be made in error.¹⁰ Groopman further suggests that 80% of these errors are predictable, based on the compressed and hurried fashion in which physicians now diagnose patients' maladies.¹⁰ e-Prescribing will not reverse this rate of inaccuracy. If the right drug is prescribed for the wrong diagnosis, the patient will always suffer.

The Benefits of e-Prescribing

e-Prescribing provides enhanced decision support for the selection of prescription products, information about formularies, dosing and frequency of such formularies, checking for allergies to particular medications, drug interactions, avoidance of therapeutic duplication, and maximum or minimum doses. Many have noted that e-prescribing can provide computer-based support for creation, transmission, dispensing, and monitoring of drug therapies. Clinical decision support and computerized physician order entry have made impacts on medication errors and have been promoted as providing a major opportunity to make huge inroads on medication errors.¹¹

e-Prescribing has been suggested to reduce clinical risk management and provide operational efficiency as well as access to electronic patient records. Enabling clinical risk management and enhanced communication can reduce the incidence of adverse drug events. e-Prescribing can provide a more accurate detailing of prescriptions and associated records.

Reduced Drug Spending

Spending on drugs as a percentage of the total US healthcare spending increased slightly between 2006 and 2007, from 10.07% to 10.14%.¹² Drivers for the significant costs of medications include increased technologies available, increasing numbers of patients and prescriptions per patient, and the number of seniors taking advantage of the Medicare Part D drug benefit.

Generic drug use accounts for more than 63% of prescriptions filled in the United States, but it remains only 20% of the total drug expenditures.¹³ One of the tangible benefits of e-prescribing in third-party programs is the potential to reduce excess spending on

drugs that are not on plan formularies and to reduce spending on drugs for which generic substitutes are available and for drugs prescribed inappropriately. Third-party plans include prescription drug plans, Medicare Advantage plans, and Medicaid plans that have formulary and generic option warnings that indicate to the prescriber and/or to the dispenser that a certain drug prescribed may not be appropriate. As more widespread adoption of e-prescribing by physicians occurs, rates of formulary compliance and generic drug utilization undoubtedly will increase.

Improved Drug-Use Process

It is difficult to predict what issues will be addressed when in the new Congress. Attempts will undoubtedly be made to streamline the drug-use process from many angles and to reduce the rate of increase in drug expenditures. The compliance of prescribers and pharmacists with formulary guidelines will be enhanced by e-prescribing, and incorporating e-prescribing as a part of a greater emphasis on HIT applications will no doubt be front and center of proposals seeking to enable more efficient drug prescribing and therapeutic use.

Several segments of e-prescribing systems will enable drugs to be used more appropriately and thus less expensively. Physicians will have alerts about formulary acceptability or lack thereof when entering a specific drug for patients; in addition, pharmacists will have computer prompts that will serve as "gate keeper" warnings for nonformulary, expensive, and inappropriately prescribed drugs.

Practical Considerations

- With hundreds of thousands of physicians' offices still to be electronically equipped to transfer prescriptions, there will be a major shift in how prescriptions are transmitted. Drug-use records will need to be converted to digital access—how this will be paid for is a concern. The Centers for Medicare & Medicaid Services has and will continue to offer incentives for e-prescribing to encourage use.
- Physicians have lagged behind other professions in utilizing electronic communication. Studies have shown that only 17% of physicians communicate with their patients via e-mail.¹⁴ This percentage will increase once electronic medical records, HIT, and policy influences are better accepted by the medical community.
- As with any computer-associated programs, appropriate care will need to be taken in the training of physicians on how to use the program. e-Prescribing

in and of itself will not solve all drug-related errors. Some have suggested that e-prescribing will enhance patient compliance with medications. Data from European studies do not necessarily bear this out.¹⁵ e-Prescribing has been in place elsewhere in the world where we see national health insurance schemes and programs. This new technology will be effective only as far as it directly improves patient care and patient outcomes and does so in an economically sound fashion.

- e-Prescribing has unlimited potential to enhance the drug-use process from prescribing to the point of patient delivery of medications. Error reduction, precise dosing, help in choosing the appropriate drug, and enhancement of quality of care are but a few of the potential and very real consequences of e-prescribing. As is often the case, the recognition of the many potential benefits and a thorough assessment of the issues that e-prescribing can and cannot address will bode well for all involved in the drug-use process. For optimal effect, e-prescribing must be part of a comprehensive revamping of how information is gathered, stored, and shared in the healthcare delivery system. ■

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